Fiscal Austerity, Unemployment and Suicide Rates in Greece

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Abstract

This study examines the effects of fiscal austerity, among other socioeconomic variables, on suicide rates in Greece over the period 1968-2011. Our results suggest that fiscal austerity, higher unemployment rates, negative economic growth and reduced fertility rates, significantly increase suicide rates in Greece, while increased alcohol consumption and divorce rates do not exert any significant influence on suicide rates. Interestingly, the effects of fiscal austerity and economic growth are gender-specific, as fiscal austerity measures and negative economic growth significantly increase male suicide rates, while no significantly effects of fiscal austerity and negative economic growth on female suicide rates could be identified. Finally, the effects of fiscal austerity on suicide rate are also age-specific, affecting mostly the population between the ages of 45 and 89 years. These results have important implications for policy makers, and for the creation and implementation of specialised suicide prevention programs in Greece by national health agencies.

Key words: Fiscal austerity; suicide rate; unemployment; debt crisis

JEL codes: H30; H55; H62; I18; J11; C22;

1 Introduction

Since the advent of the Euro zone government debt crisis, extraordinary measures were taken by individual governments and the European Central Bank (ECB) so as to prevent a potential collapse of the Euro zone (see, for instance, Roman and Bilan, 2012). Among them, the Greek

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government found underreporting its budget deficit by nearly 50%, shortly after the Greek elections, in November 2009. In particular, on 5 November 2009, the Greek public sector revised its budget deficit to 12.7% of Gross Domestic Product (GDP) from the 6% originally disclosed, which was then revised once again to the unprecedented 15.4% in November 15, 2009 (see, Figure 1). This event initiated a sovereign debt crisis that has resulted in large financial interventions in Greece and other Euro zone countries. As a consequence, fears of a Greek sovereign default on its debt and possible contagion to other beleaguered Euro zone countries were developed among investors, that led to a crisis of confidence and a widening of bond yield spreads and credit default swaps between several Euro area members and the Euro zone's largest economy, Germany.

[Insert Figure 1 around here]

At that point of time, Greece's options were limited, as the Greek government ruled out leaving the Euro, which instantaneously ceased the possibility of using a currency devaluation, so as to increase competitiveness and possibly to inflate its debt away. Instead, after time-consuming negotiations between the International Monetary Fund (IMF) and the Euro zone countries, it was decided to offer a €110 bailout package on May 2010 to Greece so as to finance and service its debt. However, this bailout loan was accompanied by strict conditions, including: (i) austerity measures, such as drastic curtailing of government spending and large increases in tax rates, (ii) large privatisation of government owned assets worth of €50 billion by the end of 2015 and (iii) strict implementation of structural reforms, so as to improve its competitiveness and growth prospects.

Indeed, Greece accepted the bailout package and started applying austerity measures, implementing structural reports and privatizing its government owned assets in order to put its economy back to a long-term sustainable path.

Conventional wisdom suggests contractionary rather than expansionary effects of fiscal austerity. Few will contest the effects of fiscal austerity on the economy, such as soaring unemployment rates and sharp declines in GDP (see, for instance, Beetsma et al., 2012; Guajardo et al., 2011; Bluedorn and Leigh, 2011; IMF, 2010). Besides, one of fiscal austerity's core aims in Greece has been to achieve large scale reductions in public sector employment. But what are the implications of fiscal austerity measures for health in Greece? Put differently, what are the effects of fiscal consolidation and austerity on suicide rates in Greece?

The recent financial and economic crisis has raised major concerns in the public health community that suicide rates will rise across the globe. Since then, an increasing amount of research on the effects of financial and debt crisis, and of unemployment on suicide rates in Greece has been conducted (see, among others, Fountoulakis et al., 2013, 2012; Rihmer et al., 2013; Kentikelenis et al., 2012; Economou et al., 2011; Kentikelenis et al., 2011; Stuckler et al., 2011, 2009). Yet, the literature on the effects of fiscal consolidation and austerity on suicide rates, according to our knowledge, is absent.

To fill in this gap in the literature, we investigate the effects of fiscal consolidation and austerity, among other socioeconomic control variables, on suicide rates in Greece. To achieve that, we collect annual observations of various socioeconomic variables over the period 1968-2011, which renders this study the most comprehensive and up-to-date one for Greece.

Our empirical findings suggest that fiscal austerity, higher unemployment rates, negative economic growth and reduced fertility rates lead to significant increases in suicide rates in Greece, while increased alcohol consumption and divorce rates do no exert any significant influence on suicide rates. Interestingly, the effects of fiscal austerity and economic growth are gender-specific, as fiscal austerity measures and negative economic growth significantly increase male suicide rates, while no significantly effects of fiscal austerity and negative economic growth on female suicide rates could be identified. Finally, the effects of fiscal austerity on suicide rates are also age-specific, affecting mostly the population between 45 and 89 years of age.

These results have important implications for policy makers, and for the creation and implementation of specialised suicide prevention programs in Greece by national health agencies. From a economic policy perspective, our results suggest that Euro zone leaders should put greater emphasis on stimulating their economies in addition to fiscal consolidation and austerity, so as to mitigate some or even all negative effects of fiscal consolidation and austerity on suicide rates. While, from a health policy perspective, specialised suicide preventions programs focusing on the most distressed citizens should be established.

The remainder of this paper is organized as follows. Section 2 describes the empirical methodology and the data used. Section 3 presents the empirical results and Section 4 summarizes and concludes this study.

2 Data and Methodology

2.1 Data

We collect annual observation of overall, male and female suicide rates for Greece from the World Health Organization Statistical Information System (WHOSIS) database between 1968-2009, and we extend them up to 2011 with unofficial data estimated from Kentikelenis et al. (2011) and from cases recorded by the Greek police as suicides. The unemployment data come the Annual Macro-Economic (AMECO) database. The evolution of these series presented in Figure 2 is very revealing. Overall suicide rates per 100,000 people increased by 30.45% from 2009 (3.47%) to 2011 (4.52%), while male suicide rates by 30.47% and female by 30.71%, suring the same period. Moreover, overall unemployment rates increased from 7.7% in 2009 to the unprecedented 17.7% in 2011.

[Insert Figure 2 around here]

According to Figure 2, unemployment rates and suicide rates seem to be highly correlated. Indeed, the correlation over the period of 1968-2011 between overall suicide rates and unemployment rates is 0.45, whereas between male suicide rates and unemployment rates and between female suicide rates and unemployment rates is 0.80 and –0.59, respectively.

Table 1 presents suicide rates by time, age group and sex. According to this table, there is clear evidence that suicide rates increase with age, and that males are more prone to commit suicide than females are throughout the years, and which is in line with the theory developed by Hamermesh and Soss (1974) and Durkheim (1897).

[Insert Table 1 around here]

In order to examine the effects of fiscal austerity on suicide rates, we collect and use the following variables as proxies of fiscal austerity/consolidation. Namely, general government final consumption expenditure as a % of GDP are obtained from World Bank's World Development Indicators (WDI) database, while general government tax revenues as a % of GDP and government balance as a % of GDP from the AMECO database. We also collect data for general government debt as a % of GDP from AMECO database. In addition, we collect data on per capita real GDP growth from WDI so as to examine the effects of business cycles on suicide rates. Finally, to control for sociological aspects of suicide rates and to minimize errors arising

from unobserved effects, we collect data for fertility rates from the World Bank's World Development Indicators (WDI) database; alcohol consumption from OECD Health database and divorce rates from EUROSTAT. Definitions and descriptive statistics for all these variables are included in Table 2.

[Insert Table 2 around here]

2.2 Empirical Methodology

Our baseline reduced-form equation to be estimated is as follows:

$$\begin{aligned} SR_{it} &= \alpha + \beta_1 SR_{it-1} + \beta_2 Growth_t + \beta_3 Fiscal_t + \beta_4 Unemp_t + \beta_5 Fert_t + \beta_6 Alc_t \\ &+ \beta_7 Div_t + \varepsilon_t \end{aligned} \quad (1)$$

where SR_{it} is the natural logarithm of suicide rates per 100,000 of i population, where $i =$ overall, male, female, over time t, where $t = 1968, ..., 2011$. SR_{it-1} is the first lag of SR_{it} and is included to account for dynamic effects and to filter serial correlation of order one, AR(1), found in the series. $Growth_t$ denotes per capita real GDP growth. $Fiscal_t$ is fiscal austerity which is proxied by either: (i) the first difference of the natural logarithm of government expenditure as a % of GDP, Gov_Exp_t, (ii) the first difference of budget deficit as a % of GDP, Def_t, and (iii) the first difference of the natural logarithm of tax revenues as a % of GDP, Tax_t. $Fert_t$ is the fertility rate, $Unemp_t$ is the unemployment rate, Alc_t is liters of per capita alcohol consumption, $Divorce_t$ is the divorce rate and ε_t is the error term which is assumed to be independently and identically distributed (IID) with zero mean and variance σ^2 for all t. The model assumes away any reverse causality or endogeneity of the independent variables.

3 Estimation results

3.1 Baseline results

Results of various specification of model (1) for the overall, male and female population are presented in Tables 3, 4 and 5, respectively. According to the results of Table 3, most of the socioeconomic variables have a significant impact on overall suicide rates in Greece. In particular, the estimated parameter of the lagged dependent variable and of real per capita GDP growth have a statistically significant positive and negative effect, respectively on overall suicide rates.

These results suggest that suicides are of persistent nature and that negative output growth leads to higher suicide rates. The latter finding is line with arguments that economic growth helps to reduce suicide rates (Neumayer, 2003).

[Insert Table 3 around here]

The estimate of fiscal austerity, proxied by percentage changes in government expenditure, on overall suicide rates is negative and significant, albeit at the 10% or 5% level, under columns (3)–(6). This result denotes that reductions in government expenditure are associated with increased suicide rates. According to the 'best' specification (determined by the goodness-of-fit statistic and the statistical significance of the variables included) under column (5) of Table 3, a 1% decrease in government expenditure leads to a 0.3% increase on overall suicide rates in Greece.

The coefficient of unemployment rates is positive and statistically significant under columns (5)–(6) denoting that higher unemployment leads to increased suicide rates and which is in line with Andrés (2005) and Gerdtham and Johannesson (2003).

Moreover, our findings suggest that increased fertility rates reduce suicide rates, while alcohol consumption and divorce rates do not exert any significant influence on overall suicide rates in Greece.

Although our estimation results for male suicide rates in Table 4 are not substantially different from those of the overall suicide rates, real per capita GDP growth and changes in government expenditure do not significantly explain female suicide rates as shown in Table 5. The effects of fiscal austerity on male suicide rates reported in Table 4 suggest that a 1% decrease in government expenditure leads to a 0.43% increase on male suicide rates in Greece.

[Insert Table 4 around here]

[Insert Table 5 around here]

These results have important implications for policy makers and for the creation and implementation of specialised suicide prevention programs in Greece by national health agencies. From a economic policy perspective, our results suggest that Greek officials, as well as Euro zone leaders, should put greater emphasis on stimulating the Greek economy, in addition to fiscal consolidation and austerity, so as to mitigate some or even eliminate all negative effects of fiscal consolidation and austerity on suicide rates. While, from a health policy perspective, specialised suicide preventions programs focusing on the most distressed citizens in Greece should

be established, as the empirical literature supports the idea that identification of suicides rates determinants and the creation of suicide prevention programs can lead to a reduction, if not prevention, of suicides (see, for instance, McKee et al., 2012; Matsubayashi and Ueda, 2011, among others).

3.2 Robustness analysis

As a robustness check, we also examine how fiscal austerity affects suicide rate by utilising different proxies of fiscal austerity, and by examining different age groups effects.

3.2.1 Alternative proxies of fiscal austerity

In this section, we estimate model (1) but with the change in government deficit as a % of GDP as proxy of fiscal austerity instead of Gov_Exp_t. In particular, we include the first difference of government budget deficit as a % of GDP, Def_t. Given the discovery of underreporting the fiscal balance by the Greek government, one of the main concerns has been its reduction, even its elimination and the return to a government surplus. Therefore, we are very interested to examine whether and how deficit changes affect suicide rates in Greece. The results of this analysis for overall, male and female population are reported in Tables 6, 7 and 8, respectively.

[Insert Table 6 around here]

[Insert Table 7 around here]

[Insert Table 8 around here]

According to these tables, the effects of reductions in the budget deficit have a positive and statistically significant, albeit limited, effect on overall suicide rates, as the estimated parameter of Def_t is significant only at the 10% level, under columns (3) and (4) of Table 6. Distinguishing between male and female population, we observe that reductions in budget deficits lead to increased male suicide rates, while no significant effects on female suicide rates could be identified. In particular, under column (5), a 1% reduction in the government deficit leads to a 1% increase in male suicide rates in Greece.[1] However, these results should be interpreted with

[1] As an additional robustness check, we repeated the above analysis with government tax revenues as a % of GDP, and then with government debt as a % of GDP instead of deficit as proxies of fiscal austerity. We also included private debt as a % of GDP so as to examine whether increases in private debt lead to increased suicides. These

caution, as the number of observations is very limited due to data unavailability for these series during the early years of our sample, and the goodness-of-fit statistic, R^2, is relatively low. In particular, the starting date for the deficit variable is 1988 and thus our results might be biased due to the limited number of degrees of freedom.

3.2.2 Fiscal austerity and suicide rates by age groups

Several studies have found evidence that the effects of socioeconomic variables on suicide rates depend on age (see, for instance, Pitman et al., 2012; Andrés, 2005; Neumayer, 2004; Markowitz et al., 2003; Jungeilges and Kirchgassner, 2002, among others). Thus, we now examine whether the effects of fiscal austerity (among other socioeconomic variables) on suicide rates depend also on age. To achieve that, we estimate model (1) with the dependent variable, SR_{it}, now denoting the natural log of the suicide rates by four age groups, namely, 10–24, 25-44, 45-64 and 65-89 years.

Before discussing these results, we present some descriptive statistics of suicide rates four these four age groups in Table 9. It is clear from this table that suicide rates increase with age and which supports the theoretical arguments of Hamermesh and Soss (1974).

[Insert Table 9 around here]

Even though, suicide rates are the highest for the age group 65–89 years, Figure 3 shows a declining trend of suicide rates for this age group since the beginning of the 1990s. Interestingly, suicide rate for that age group fell below those of the age group 45–64 years in 2003 and 2009.

[Insert Figure 3 around here]

The results of model (1) by the four age groups are presented in Table 10. According to this table, our findings suggest age-specific effects of suicide rate determinants.

[Insert Table 10 around here]

First, none of the socioeconomic variables, apart from the lagged dependent variable, have a significant impact on suicide rates for the age group 10–24 years. This result is plausible, as there might be other individual risk factors for suicide rates in the young population, such

results, which are available upon request, suggest that changes in the government tax revenues as a % of GDP, or in government debt as a % of GDP, or in the private debt as a % of GDP do not exert any significant influence on either overall, male or female suicide rates.

as childhood and personality disorders and drug dependence (Pitman et al., 2012). Besides, suicide rates for the age group 10–24 are the lowest among our four age group classification (see Table 9).

Second, and more importantly, fiscal austerity proxied by reductions in government spending leads to a significant increase in suicide rates for the age group 65–89 years (columns 7 and 8 in Table 10) and 45–64 years (column 6 in Table 10). This is very plausible as those age groups include the largest parts of the population in Greece that have been heavily affected by large scale reductions in their pensions and salaries, respectively.

Third, negative economic growth leads to a significant increase in suicide rates for the age groups 25–44 and 65–89 years (columns 3–4 and 7–8 in Table 10), and, to a smaller extent, in the age group of 45–64 years (column 6 in Table 10).

Fourth, unemployment is a significant determinant of increased suicide rates for the age group 25–44 years (columns 3–4 in Table 10) and, to a smaller extent, of reduced suicide rates for the age group 65–89 (column 7 in Table 10), while no significant effects of unemployment on suicide rates for the age groups 10–24 and 45–64 could be identified. Therefore, our results suggest that unemployment-stricken population between the years 25 and 44, i.e., the most highly productive and skilled part of the labour force, have a higher probability to commit suicide if become unemployed than the population in any other age group. In particular, a 1% increase in unemployment rates leads to 3.5% increase in suicide rates for the age groups 25–44 years (column 3 in Table 10).

Fifth, the estimated parameter of fertility rates is negative and statistically significant only for the age groups 25–44 and 45–64 years. This results suggests that only that declines in fertility rates of the most fertile population between the ages of 25 and 64, lead to significant increases in suicide rates in Greece.

Finally, the estimated parameters of alcohol consumption and divorce rates are paradoxically significantly negative for the age groups 45–64 and 65–89, respectively, indicating that alcohol consumption and divorce rates reduce suicide rates for these age groups in Greece.

4 Conclusion

This study provides novel results on the effects of fiscal austerity, among other socioeconomic variables, on suicide rates in Greece over the period 1968-2011. Our findings suggest that fiscal austerity, higher unemployment rates, negative economic growth and reduced fertility rates,

lead to significant increases in suicide rates in Greece, while increased alcohol consumption and divorce rates do not exert any significant influence on suicide rates. Interestingly, the effects of fiscal austerity and economic growth are gender-specific, as fiscal austerity measures and negative economic growth significantly increase male suicide rates, while no significantly effects of fiscal austerity and negative economic growth on female suicide rates could be identified. Finally, the effects of fiscal austerity on suicide rates in Greece are also age-specific, affecting mostly the population between 45 and 89 years of age. These results have important implications for policy makers, and for the implementation of specialised suicide prevention programs in Greece by national health agencies.

Given that austerity has been a worldwide phenomenon, especially among European countries since the beginning of the financial crisis and the Euro zone debt crisis, it will be of great importance to examine whether our results generalise to other European countries. An analysis which we leave as an avenue for future research.

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Figure 1: Real per capita GDP growth, Government Expenditure, Government Debt and Government Deficit

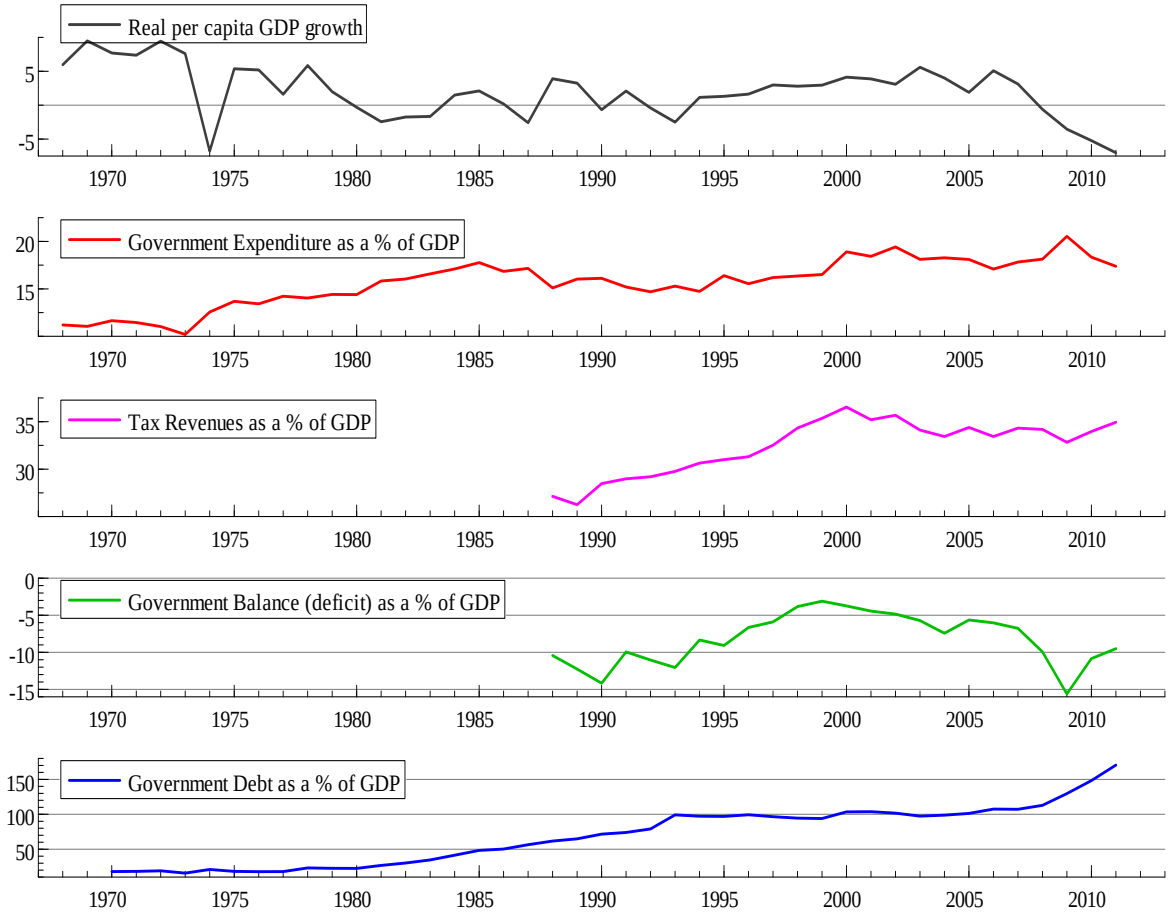


Figure 2: Suicide rates per 100,000 residents (%) and Unemployment rates (%)

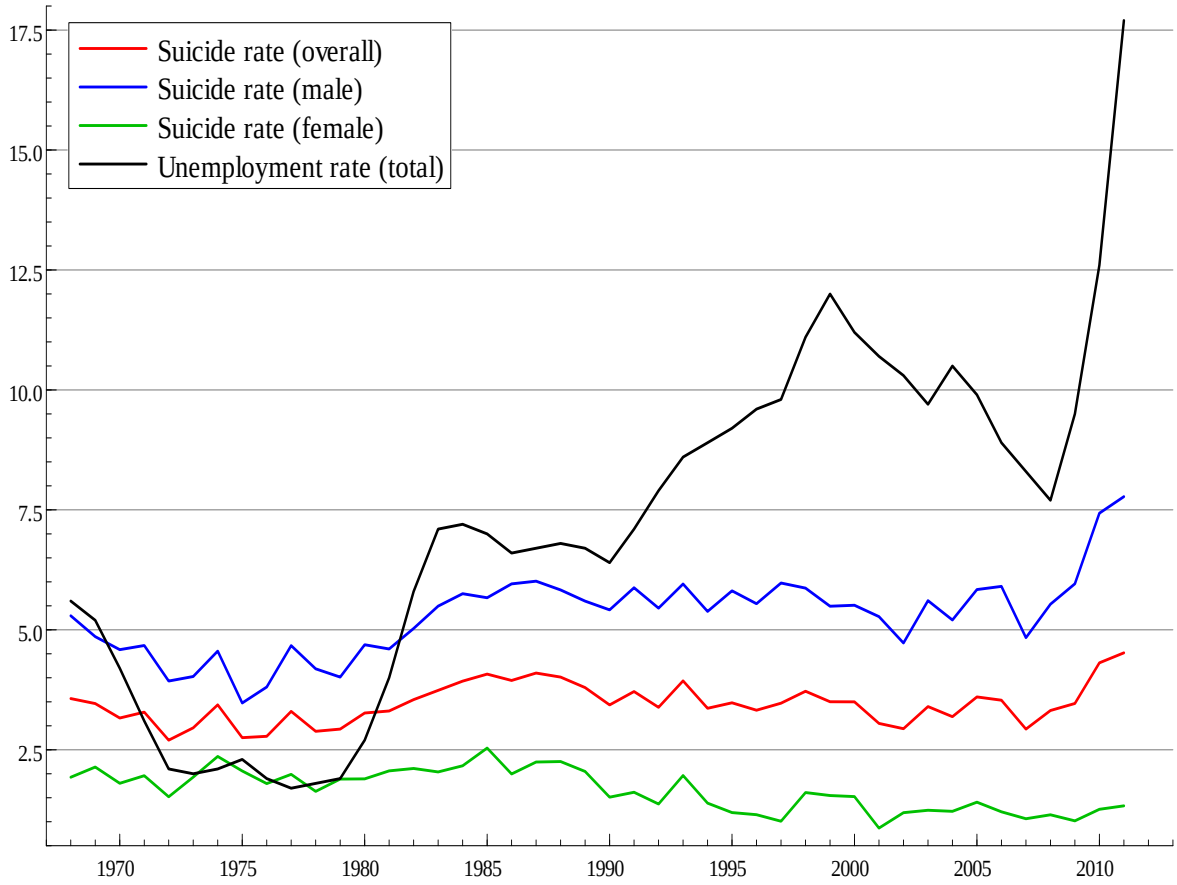
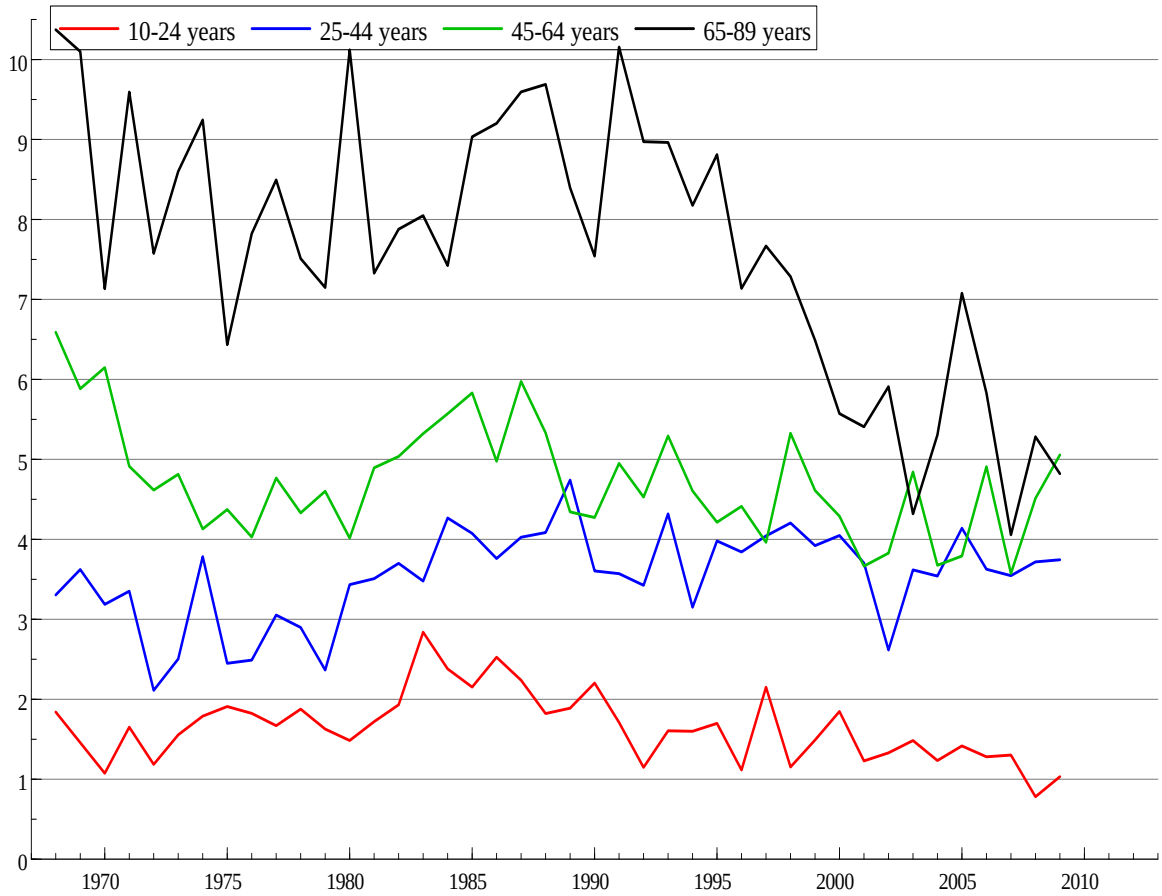


Figure 3: Suicide rates by age groups



Note: Suicide rates by age group are not available for 2010 and 2011.

Table 1: Suicide rates per 100,000 resident, by time, sex and age group

	1970			1980			1990			2000			2009			2011		
Age group	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female
0–4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
5–9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
10–14	0.14	0	0.29	0.77	1.24	0.27	0.40	0.78	0	0.33	0.64	0	0	0	0	-	-	-
15–19	1.36	0.59	2.17	1.10	1.61	0.57	1.32	2.05	0.54	2.59	3.12	2.00	1.05	1.69	0.36	-	-	-
20–24	1.72	2.74	0.64	2.58	4.51	0.58	4.89	8.17	1.56	2.63	4.34	0.75	2.05	3.64	0.33	-	-	-
25–29	4.32	6.47	2.29	3.08	5.16	0.94	4.04	6.72	1.38	4.51	7.61	1.22	3.40	5.08	1.58	-	-	-
30–34	1.46	1.71	1.23	3.35	5.56	1.20	3.94	6.24	1.67	3.83	5.50	2.12	4.61	7.78	1.20	-	-	-
35–39	2.10	3.72	0.58	3.02	4.03	2.06	2.97	5.04	0.89	3.98	6.66	1.28	3.87	6.21	1.40	-	-	-
40–44	4.87	8.46	1.48	4.29	7.06	1.76	3.48	6.06	0.91	3.87	6.51	1.28	3.09	4.99	1.16	-	-	-
45–49	3.32	4.94	1.86	2.64	3.34	1.99	3.49	3.88	3.11	2.98	5.41	0.57	5.48	9.51	1.49	-	-	-
50–54	6.56	8.76	4.65	5.27	7.07	3.59	4.65	6.37	3.02	5.84	8.02	3.74	5.87	11.10	0.77	-	-	-
55–59	7.49	10.20	4.95	4.30	6.37	2.37	3.95	7.13	0.89	3.34	6.17	0.68	4.46	7.32	1.70	-	-	-
60–64	7.22	11.08	3.53	3.85	4.18	3.56	5.00	6.73	3.41	4.99	7.00	3.22	4.41	8.90	0.29	-	-	-
65–69	6.63	13.14	0.99	5.71	9.39	2.54	5.08	6.70	3.69	4.07	7.31	1.23	4.08	6.46	2.06	-	-	-
70–74	4.56	6.96	2.70	8.77	11.06	6.82	3.83	7.29	1.06	5.25	9.09	2.06	2.61	4.7	0.94	-	-	-
75–79	8.95	8.93	8.97	6.29	8.17	4.85	7.31	13.80	2.35	5.76	8.25	3.79	4.38	8.74	1.05	-	-	-
80–84	5.76	12.05	1.59	16.85	30.47	7.43	10.72	21.12	2.83	6.26	11.21	2.69	7.38	13.85	2.66	-	-	-
85–89	9.76	17.42	4.65	12.99	21.28	7.72	10.76	23.01	2.74	6.52	10.74	3.29	5.65	11.69	1.22	-	-	-
90–94	-	-	-	-	-	-	-	-	-	12.76	44.49	0	12.58	25.70	0	-	-	-
95 and above	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	-	-
All ages	3.16	4.59	1.80	3.27	4.69	1.89	3.44	5.42	1.51	3.50	5.51	1.52	3.47	5.96	1.02	4.52	7.78	1.33

Note: - sign denotes no data availability.

Table 2: Variable definitions and descriptive statistics

Variable		Definition	Obs.	Mean	Std.	Min.	Max.
Suicide rate$_t$	Overall	Suicide rates (deaths per 100,000 people)	44	3.4554	0.4165	2.7001	4.5205
	Male		44	5.2979	0.8501	3.4750	7.7759
	Female		44	1.6633	0.4281	0.8682	2.5360
Real GDP per$_t$ capita growth$_{tt}$		Growth rate of per capita real GDP (%)	43	1.8399	3.8711	-7.268	9.0744
Government Expenditure$_t$		General government final consumption expenditure as a % of GDP	44	15.6667	2.4890	10.1991	20.5371
Tax$_t$		General Government tax revenues as a % of GDP	24	32.4160	2.8688	26.2545	36.5393
Deficit$_t$		General government balance as a % of GDP	24	-8.2144	3.4164	-15.6079	-3.0970
Government Debt$_t$		General government debt as a % of GDP	42	69.3692	41.3919	15.74	170.5534
Fertility$_t$		Fertility rate (births per woman)	44	1.7201	0.4520	1.24	2.559
Unemployment$_t$	Total	Unemployment rate (% of total labor force)	44	7.0931	3.5963	1.7	17.7
	Male		32	6.05	2.1079	2.5	15
	Female		32	13.3625	3.3426	3.8	21.4
Alcohol$_t$		Per capita alcohol consumption (liters, age 15+)	44	9.5705	1.8012	6.5	13.2
Divorce$_t$		Divorce rates (per 1,000 people)	42	0.75	0.2716	0.4	1.2

Table 3: Fiscal austerity and suicide rates - overall

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.6515***	0.5577***	0.5080***	0.4221***	0.2854**	0.2856**	0.2796**
	(0.1046)	(0.0924)	(0.0971)	(0.0976)	(0.1193)	(0.1214)	(0.1338)
$Growth_t$		-0.0148***	-0.0165***	-0.0163***	-0.0139***	-0.0142***	-0.0165***
		(0.0032)	(0.0031)	(0.0029)	(0.0031)	(0.0032)	(0.0045)
Gov_Exp_t			-0.0035*	-0.0038**	-0.0031*	-0.0032*	-0.0041
			(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0024)
$Fert_t$				-0.0084**	-0.0109***	-0.0111***	-0.0126***
				(0.0035)	(0.0038)	(0.0038)	(0.0040)
$Unemp_t$					0.0086**	0.0083*	0.0079
					(0.0040)	(0.0043)	(0.0065)
Alc_t						-0.0020	-0.0059
						(0.0062)	(0.0065)
Div_t							0.0233
							(0.0774)
Constant	0.4330***	0.5752***	0.6430***	0.7366***	0.8345***	0.8559***	0.8918***
	(0.1284)	(0.1138)	(0.1191)	(0.1184)	(0.1246)	(0.1396)	(0.1836)
Obs.	43	43	43	43	43	43	41
R^2	0.3721	0.5874	0.6205	0.6675	0.7075	0.7081	0.6357

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 4: Fiscal austerity and suicide rates - male population

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.8443***	0.7496***	0.6883***	0.6842***	0.2761**	0.2780**	0.2657**
	(0.1013)	(0.0814)	(0.0770)	(0.0802)	(0.1231)	(0.1241)	(0.1301)
$Growth_t$		-0.0152***	-0.0177***	-0.0176***	-0.0142***	-0.0136***	-0.0160***
		(0.0034)	(0.0032)	(0.0032)	(0.0028)	(0.0030)	(0.0038)
Gov_Exp_t			-0.0047**	-0.0047**	-0.0043**	-0.0042**	-0.0052**
			(0.0023)	(0.0023)	(0.0018)	(0.0017)	(0.0023)
$Fert_t$				-0.0016	-0.0060*	-0.0055	-0.0081**
				(0.0034)	(0.0034)	(0.0035)	(0.0034)
$Unemp_t$					0.0217***	0.0220***	0.0191**
					(0.0058)	(0.0060)	(0.0082)
Alc_t						0.0031	-0.0021
						(0.0071)	(0.0069)
Div_t							0.0805
							(0.0681)
Constant	0.2651	0.4489***	0.5593***	0.5636***	1.0675***	1.0312***	1.0656***
	(0.1707)	(0.1394)	(0.1301)	(0.1329)	(0.1691)	(0.1784)	(0.2116)
Obs.	43	43	43	43	43	43	41
R^2	0.6123	0.7329	0.7635	0.7645	0.8290	0.8298	0.7924

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 5: Fiscal austerity and suicide rates - female population

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.7426***	0.7610***	0.7551***	0.6494***	0.4329***	0.4416***	0.3673**
	(0.0958)	(0.1020)	(0.1052)	(0.1217)	(0.1345)	(0.1376)	(0.1492)
$Growth_t$		-0.0086	-0.0076	-0.0043	-0.0112	-0.0130	-0.0171
		(0.0069)	(0.0064)	(0.0075)	0.0077)	(0.0081)	(0.0103)
Gov_Exp_t			0.0024	0.0031	0.0002	-0.0001	-0.0018
			(0.0037)	(0.0046)	(0.0044)	(0.0044)	(0.0055)
$Fert_t$				-0.0210**	-0.0250***	-0.0263***	-0.0265***
				(0.0091)	(0.0082)	(0.0079)	(0.0089)
$Unemp_t$					-0.0264***	-0.0273***	-0.0195
					(0.0094)	(0.0095)	(0.0129)
Alc_t						-0.0111	-0.0126
						(0.0136)	(0.0158)
Div_t							-0.1884
							(0.1614)
Constant	0.1146*	0.1216**	0.1201*	0.1349**	0.4366***	0.5479***	0.7024***
	(0.0583)	(0.0594)	(0.0600)	(0.0559)	(0.1127)	(0.1895)	(0.2383)
Obs.	43	43	43	43	43	43	41
R^2	0.5510	0.5655	0.5686	0.6231	0.6851	0.6891	0.6969

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 6: Government deficit and suicide rates - overall

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.5059**	0.3889**	0.1934	0.1059	0.0892	0.0493	-0.1305
	(0.1952)	(0.1780)	(0.2084)	(0.2114)	(0.2119)	(0.2583)	(0.2760)
$Growth_t$		-0.0158***	-0.0182***	-0.0169***	-0.0153***	-0.0150***	-0.0018
		(0.0053)	(0.0043)	(0.0044)	(0.0046)	(0.0043)	(0.0090)
Def_t			0.0128**	0.0103*	0.0088	0.0075	-0.0025
			(0.0053)	(0.0051)	(0.0057)	(0.0060)	(0.0110)
$Fert_t$				-0.0081	-0.0084	-0.0077	-0.0046
				(0.0066)	(0.0069)	(0.0073)	(0.0086)
$Unemp_t$					0.0060	0.0104	0.0060
					(0.0060)	(0.0106)	(0.0158)
Alc_t						0.0124	0.0414
						(0.0258)	(0.0361)
Div_t							-0.0334
							(0.1854)
Constant	0.6236**	0.7912***	1.0326***	1.1381***	1.0981***	0.9882***	0.9734
	(0.2426)	(0.2250)	(0.2585)	(0.2601)	(0.2435)	(0.2874)	(0.5962)
Obs.	24	24	23	23	23	23	21
R^2	0.2160	0.4415	0.5483	0.5885	0.6030	0.6082	0.3355

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 7: Government deficit and suicide rates - male population

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.6165**	0.3013	0.1257	0.1027	-0.1021	-0.0944	-0.1977
	(0.2910)	0.1955)	(0.2277)	(0.2766)	(0.3078)	(0.3364)	(0.3584)
$Growth_t$		-0.0193***	-0.0216***	-0.0213***	-0.0192***	-0.0192***	-0.0063
		(0.0055)	(0.0050)	(0.0048)	(0.0044)	(0.0042)	(0.0101)
Def_t			0.0130**	0.0123**	0.0097*	0.0101*	0.0019
			(0.0054)	(0.0054)	(0.0049)	(0.0050)	(0.0088)
$Fert_t$				-0.0025	-0.0041	-0.0043	-0.0034
				(0.0062)	(0.0072)	(0.0069)	(0.0079)
$Unemp_t$					0.0155*	0.0144	0.0076
					(0.0076)	(0.0126)	(0.0162)
Alc_t						-0.0030	0.0325
						(0.0264)	(0.0422)
Div_t							0.0699
							(0.1585)
Constant	0.6747	1.2458***	1.5494***	1.5882***	1.7880***	1.8136***	1.6195*
	(0.4987)	(0.3412)	(0.3929)	(0.4740)	(0.4716)	(0.4903)	(0.8732)
Obs.	24	24	23	23	23	23	21
R^2	0.2439	0.5214	0.6034	0.6071	0.6758	0.6761	0.2065

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 8: Government deficit and suicide rates - female population

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SR_{t-1}	0.5165***	0.5309***	0.4282**	0.3548**	0.3042*	0.1936	0.0849
	(0.1552)	(0.1662)	(0.1768)	(0.1280)	(0.1661)	(0.2653)	(0.3235)
$Growth_t$		-0.0061	-0.0076	-0.0015	-0.0048	-0.0016	0.0058
		(0.0107)	(0.0105)	(0.0111)	(0.0143)	(0.0115)	(0.0241)
Def_t			0.0175	0.0088	0.0121	0.0038	-0.0052
			(0.0126)	(0.0140)	(0.0147)	(0.0149)	(0.0312)
$Fert_t$				-0.0216	-0.0226	-0.0193	-0.0085
				(0.0136)	(0.0134)	(0.0140)	(0.0195)
$Unemp_t$					-0.0147	0.0043	0.0032
					(0.0192)	(0.0179)	(0.0330)
Alc_t						0.0701	0.0435
						(0.0825)	(0.1200)
Div_t							-0.3988
							(0.3447)
Constant	0.1319**	0.1354**	0.1551**	0.1640***	0.3255	-0.4926	0.1582
	(0.0594)	(0.0618)	(0.0585)	(0.0550)	(0.2308)	(0.8277)	(1.1883)
Obs.	24	24	23	23	23	23	21
R^2	0.3214	0.3287	0.2714	0.3461	0.3647	0.4021	0.4522

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.

Table 9: Suicide rates, by age groups

Age group	**Obs.**	**Mean**	**Std.**	**Min.**	**Max.**
10–24	42	1.6489	0.43205	0.7806	2.8388
25–44	42	3.5368	0.58605	2.1110	4.7410
45–64	42	4.7334	0.70988	3.5735	6.5891
65–89	42	7.6553	1.67447	4.0567	10.3729

Note: The analysis is based on data between 1968-2009 as suicide rates by age are not available for 2010 and 2011.

Table 10: Fiscal austerity and suicide rates, by age groups

	10–24 years		**25–44 years**		**45–64 years**		**65–89 years**	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SR_{t-1}	0.3344**	0.2887*	0.0075	0.0209	0.2147*	0.1447	0.4664***	0.2684*
	(0.1550)	(0.1631)	(0.1139)	(0.1226)	(0.1181)	(0.1331)	(0.1235)	(0.1447)
$Growth_t$	-0.0121	-0.0052	-0.0170**	-0.0177**	-0.0048	-0.0115*	-0.0187**	-0.0232**
	(0.0130)	(0.0145)	(0.0069)	(0.0086)	(0.0055)	(0.0057)	(0.0081)	(0.0088)
Gov_Exp_t	0.0026	0.0047	-0.0002	-0.0005	-0.0042	-0.0065**	-0.0098**	-0.0111**
	(0.0064)	(0.0075)	(0.0039)	(0.0038)	(0.0026)	(0.0030)	(0.0046)	(0.0053)
$Unemp_t$	-0.0116	-0.0045	0.0349***	0.0298***	-0.0025	-0.0016	-0.0207***	-0.0002
	(0.0113)	(0.0223)	(0.0084)	(0.0103)	(0.0050)	(0.0085)	(0.0074)	(0.0102)
$Fert_t$	-0.0221	-0.0168	-0.0162**	-0.0182***	-0.0198***	-0.0246***	-0.0116	-0.0109
	(0.0138)	(0.0146)	(0.0064)	(0.0064)	(0.0059)	(0.0059)	(0.0070)	(0.0071)
Alc_t		0.0282		-0.0047		-0.0227**		0.0008
		(0.0283)		(0.0156)		(0.0108)		(0.0170)
Div_t		-0.1117		0.0721		-0.0331		-0.4169**
		(0.2524)		(0.0994)		(0.1314)		(0.1932)
Constant	0.3765***	0.1493	1.0228***	1.0308***	1.2132***	1.5727***	1.2405***	1.8242***
	(0.1315)	(0.2927)	(0.1222)	(0.2535)	(0.1889)	(0.2751)	(0.2702)	(0.4615)
Obs.	41	41	41	41	41	41	41	41
R^2	0.3477	0.3688	0.5710	0.5756	0.4114	0.4593	0.5704	0.6280

Note: Robust SEs in parenthesis. *, ** and *** indicate significance at 10%, 5% and 1% level, respectively.